



MGD 2621 P
Medical Greyscale
Display

Installation & User Manual

Warning

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

SAFETY INSTRUCTIONS



CAUTION

RISK OF ELECTRIC SHOCK
DO NOT OPEN



**CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK)
NO USER-SERVICEABLE PARTS INSIDE
REFER TO QUALIFIED SERVICE PERSONNEL**

- Read the safety and operating instructions before operating the apparatus.
- Retain safety and operating instructions for future reference.
- Adhere to all warnings on the apparatus and in the operating instructions manual.
- Follow all instructions for operation and use.
- This apparatus conforms to: IEC601-1, UL2601-1, cUL2601-1, EN 60601-1
- This apparatus is classified as Type B without Applied Part.
- Class I equipment
- Equipment **not** suitable for use in the presence of a **flammable anaesthetic mixture with air or with oxygen or nitrous oxide.**
- FCC notice

This equipment has been tested and found to comply with the limits of a class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.



Power connection

- Power cord: Utilise a UL-listed detachable power cord, 3-wire, type SJ or equivalent, 18 AWG min., rated 300 V min., provided with a hospital-grade type plug 5-15P configuration for 120V application, or 6-15P for 240V application.
- **Warning:** This apparatus must be earthed!
- Power requirements: connect the apparatus to an AC voltage as indicated at its back. Using a lower voltage, the apparatus will not be able to operate. Using a higher voltage may damage the apparatus. If you are not sure of the type

of power supplied, consult the power company.

- Do not overload wall outlets and extension cords as this may result in fire or electric shock.
- Mains lead protection (U.S.: Power cord): Supply cords should be routed so that they are not likely to be walked upon or pinched by items placed upon or against them, paying particular attention to cords at plugs and receptacles.

Water and moisture

- Never expose the apparatus to rain or moisture.
- Never use the apparatus near water - e.g. near a bathtub, washbasin, swimming pool, kitchen sink, laundry tub or in a wet basement.

Ventilation

- Do not cover or block the ventilation openings in the cover of the set. When installing the apparatus in a cupboard or another closed location, heed the necessary space between the set and the sides of the cupboard.

Installation

- Place the apparatus on a flat, solid and stable surface that can bear the weight of at least 3 monitors. If you use an unstable cart or stand, the set may fall, causing serious injury to a child or adult, and serious damage to the equipment.

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INTRODUCTION

Overview

Resolution and bandwidths

The BARCO MGD 2621 P is a high-resolution greyscale portrait display. Its outstanding visual performance, combining a 2 MegaPixel resolution with a very high brightness, makes it ideal for medical imaging and many other medical and scientific applications.

The MGD 2621 P is compatible with any AC power system worldwide and automatically synchronises to a wide range of sync frequencies. Its high-speed video amplifier supports pixel clocks up to 250 MHz.

The memory system

The internal memory system can contain the adjustments for 4 different scanning formats, the so-called scanning modes. Each scanning format is characterized by its sync signals. The display's internal micro controller continuously samples the connected sync signals and compares them to the scanning modes already stored in the memory. If the connected signal has already been stored, the micro controller adapts the image to the corresponding adjustment values in the memory, and further adjustments are unnecessary.

Image conformity and consistency

Image conformity and consistency are the keywords. In our factory, the MGD 2621 P displays are perfectly adjusted and calibrated before they are shipped to the customer. Internal circuits, like the TrueGrey® and Automatic White Stability (AWS) systems, ensure display consistency over time.

Conformity with the original image quality is guaranteed by the automatic calibration, which can be done by means of an optical sensor, connected to the Sensor connector on the display. The sensor is not supplied with the display.

Calibration and adjustments

The conformity calibration, as well as the complete adjustment of the display, can be performed by means of the remote, user-friendly MediCal® software package. MediCal, which runs under Microsoft Windows NT, is especially developed to adjust and check BARCO's medical displays.

A lot of adjustments can also be done on the monitor itself, by means of an extensive on-screen menu system, accessible from the rear panel controls.

Power saving system

The MGD 2621 P is equipped with a power saving system.

When left idle for a certain time, the computer, connected to the display, will power down the display in several steps. The power saving system can be switched on or off during the installation or adjustment of the display.

This system requires a computer imaging board that supports power saving management.

Important: It is absolutely necessary that the impedances of imaging board and display are the same. If not, the image quality will be inferior.

The MediCal software and the X-Rite DTP92 sensor are not delivered with the display.

MediCal can be ordered separately.

About the manuals

This guide is meant for people who want to install and use the MGD 2621 P display, as well as people who need to install and adjust the display. Chapter 4, Adjustments, is meant for this second category only, because it describes actions and procedures that require a technical skill to be performed properly.

The use of the software MediCal is described in the MediCal User's Manual.

INSTALLATION

Precautions

- Keep your original packaging. It is designed for this display and is the ideal protection during transport.
- Do not lift the display all by yourself to avoid injury.
- Avoid reflections in the picture tube to reduce eye strain.
- Place the display on a strong and stable table or desk if used as desktop display.
- Keep the display away from heat sources and provide enough ventilation in case it is built in a rack or console.
- Keep the display away from strong sources of magnetic fields.
- Make sure the display and computer are both switched off before connecting the signals.

The package contents

- The MGD 2621 P display
- The accessory box (in which you found this manual)

Notes:

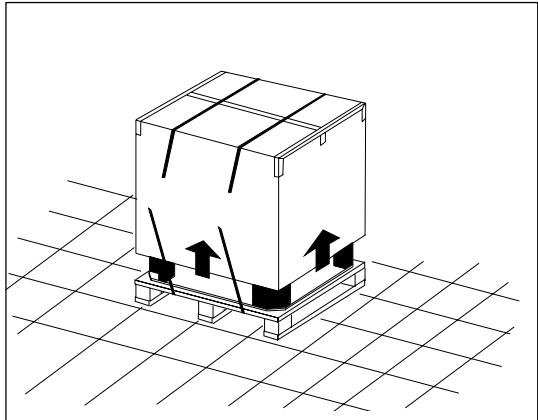
- The MGD 2621 P can be part of a complete **MeDis® system**, consisting of the display itself, an imaging board and software. In that case, the package contains a lot more items. The contents of the package is then described in the manual of the complete system.
- The **ambient light shield** inside the accessory box should always be used during conformity calibration with the X-Rite DTP92 optical sensor.

Unpacking the display

The display is packed in a box on a pallet.

To unpack:

1. Cut the ribbons around the box by means of a pair of wire-cutters.
2. Lift the box from the pallet.
The display remains standing on the pallet.
3. Remove the Accessory box and the upper polystyrene piece.
4. Remove the plastic bag from the display.
5. Lift the display out of the lower polystyrene piece.

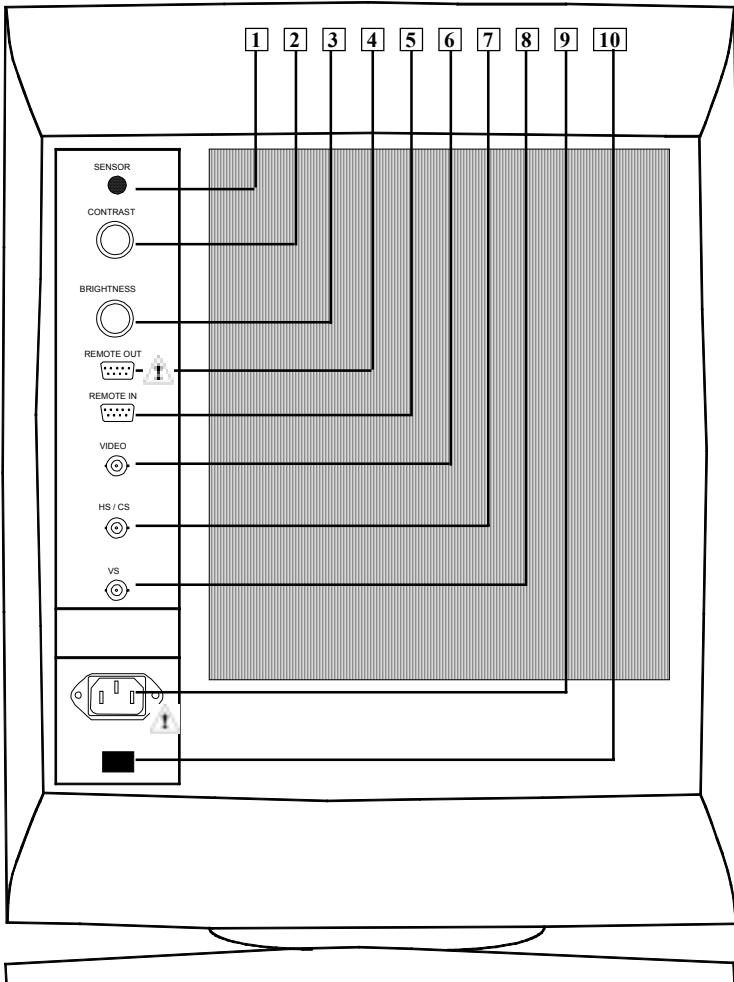


Power connection

1. Power cord: Utilise a UL-listed detachable power cord, 3-wire, type SJ or equivalent, 18 AWG min., rated 300 V min., provided with a hospital-grade type plug 5-15P configuration for 120V application, or 6-15P for 240V application.
2. Plug one end of the power cord into the rear of the display (connector LINE {9}). Plug the other end into a **grounded** AC power outlet. The display automatically adapts to the voltage. The voltage range is: 100-240 VAC +/- 10%.

Location of controls and connectors

- {1} Optical sensor plug
- {2} Contrast knob
- {3} Brightness knob
- {4} Remote (RS-232) output
- {5} Remote (RS-232) input
- {6} Video input
- {7} Horizontal / composite sync. input
- {8} Vertical sync. input
- {9} Power input
- {10} Power button



Connection of video signals



The connected equipment must comply to all relevant safety demands.

Important: The use of low-quality video cables can distort the video signal and influence diagnosis.

1. Check the **termination impedance** of the display's video input and the impedance of the imaging board that produces the video signals you want to connect. You can find the termination impedance of the video input on the label on the rear of the display. Both values must be equal. If not, the quality of the images on the display will be inferior.
2. Connect the video output of the computer's imaging board to the **video and sync inputs** on the display's rear panel. Use a proper video cable. The video cable is not supplied with the display, unless the display comes as part of a complete BARCO MeDis system, that also contains an imaging board.

The inputs accept the following signals:

- Video with separate horizontal and vertical sync.
 - The video cable has 3 wires.
 - Connect the video signal to the connector Video **{6}**.
 - Connect the horizontal sync signal to the connector HS/CS **{7}**.
 - Connect the vertical sync signal to the connector VS **{8}**.
- Video with external composite sync.
 - The video cable has 2 wires.
 - Connect the video signal to the connector Video **{6}**.
 - Connect the composite sync signal to the connector HS/CS **{7}**.
- Video with internal composite sync (sync on video).
 - The video cable has 1 wire.
 - Connect the video (with sync) signal to the connector Video **{6}**.

Notes:

- The video inputs cannot be connected in loop-through (daisy-chain).
- The required video amplitude: 700 mV \pm 3 dB.
- The required sync. amplitude: 400 mV.

Connection of data signals

The display can be controlled remotely by a computer through the serial data bus. A typical example of this, is the **MediCal** software that controls the display. MediCal runs on a PC that is connected through the serial data bus. This PC is not necessarily the same computer as the one that produces the video signals.

Unlike the video signals, it is possible to daisy-chain the serial data bus. This means you can control different displays from one PC.

To connect the data signals:

1. Connect one end of the serial data cable to one of the PC's **COM ports**. If the COM port has a 25-pin connector, you will need to use a **D25-to-D9 interface connector**. The cable and the interface connector are both supplied with **MediCal**.
2. Connect the other end of the serial data cable to the **Remote In** connector **{5}** on the display's rear panel.
3. For a daisy-chain application, connect the **Remote Out** connector **{4}** of the first display to the **Remote In** connector **{5}** of the next display.

Connection of an optical sensor



At the front, the sensor plug is located under the bezel.

To calibrate the display, connect the optical sensor to the **Sensor** connector **{1}** at the front or on the rear panel.

Notes:

- The display supports the DTP 92 from X-Rite as optical sensor.
- The optical sensor is not supplied by BARCO.
- Calibration can be done by means of MediCal only.
- **Always use the Ambient Light Shield during calibration.**

Important considerations

- The best environment for diagnostic imaging is one with controlled and dimmed ambient light. The human eye's sensitivity depends on the ambient light strength. It is most sensitive to small contrast changes (or subtle image details) at limited ambient light levels.
- The best ambient light level, expressed in Lux, depends on the application. An office illumination typically requires 500 Lux. A dimmed environment, like a softcopy room, requires less than 100 Lux.
- Using your display in a controlled and dimmed environment also extends its lifetime, because the display can operate at limited brightness and contrast. These levels correspond to the calibrated position in most cases.
- A controlled ambient light environment implies the ambient light is as constant as possible. Cover windows to keep out the daylight. Avoid switching the lights and viewing boxes on and off. A consistent environment results in more image consistency and less eye fatigue.
- Avoid reflections in the picture tube. Provide indirect lighting. Don't place the displays in front of or close to a light source like a window or viewing box, although this may be very tempting. As a rule of thumb, keep viewing boxes at least one metre (3 feet) away from the displays.

OPERATION: USER CONTROLS

How to switch on the display

Press the Power button {10} on the rear panel to switch on the display.

Note: The display can be switched off by the automatic power saving system. This is indicated by the green LED. **The LED is ON when the display is in stand-by.**

How to use the automatic power saving system

The power saving system, if switched on, can power down the display when you don't use the computer that produces the video and sync. signals for a while. In that way, the system reduces the display's power consumption. While the display is powered down, the picture tube will be blanked, and the green LED on the front is on. The power saving system is switched off when the display is produced. It can be switched on by a qualified technician.

Note: The power saving system can only work if the connected imaging board supports power management.

For more details, please read Appendix A, "Background information".

How to control contrast and brightness

The contrast knob {2} and the brightness knob {3} are located on the rear panel.

When you turn one of the knobs, the on-screen display (OSD) appears.

How to use the rear panel knobs

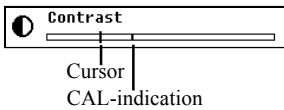
- As you turn the knob, you feel 'clicks'.
- Turn the knob clockwise to increase the contrast or brightness value. Turn counter-clockwise to decrease the value.
- A moveable cursor in the OSD indicates the current value.
- Turn the knob quickly to move the cursor in big steps. Turn slowly to move in small steps.



Turning the knob clockwise increases the value (rear view)

Note: When you change the contrast (brightness) control one step at the time (click per click), the picture contrast (brightness) will change although the cursor on the OSD does not move. This is because contrast (brightness) can be adjusted in more than 4000 steps, and the OSD is only 6 inches wide.

Advised setting for contrast and brightness



A fixed vertical dash in the OSD indicates the calibrated value. This is the advised display setting for optimum image performance and consistency in a controlled ambient light environment.

When you select the calibrated position, the word CAL appears in the OSD.

How to use LUC

Luminance Uniformity Correction (LUC) is a system that matches the luminance at the edge of the picture tube to the luminance in the center. As a result, the overall luminance is more uniform.

LUC is switched on when the display is produced. It can be switched off by a qualified technician.

For more details, please read Appendix A, "Background information".

ADVANCED ADJUSTMENTS (FOR SERVICE STAFF ONLY)

The MediCal software

The display is actually designed to be adjusted by means of MediCal. MediCal provides a very user-friendly way to control and adjust the display. Even more, you need MediCal to automatically calibrate the display.

The on-screen menu system

Especially for circumstances where MediCal is not available, an extended on-screen menu system is provided. **Only qualified service personnel should use it!**

There are 7 menus. Each menu contains several items.

To display the on-screen menus:

Turn the **Contrast** and **Brightness** knobs on the rear panel simultaneously. The first menu item appears.

To navigate through the menu system:

- 1 Turn the **Contrast** knob to select another menu.
Turn clockwise to step forward through the different menus. Turn counter-clockwise to step backward.
- 2 Turn the **Brightness** knob ONCE (in either sense) to enter the selected menu. The first item of the menu appears.
- 3 Turn the **Contrast** knob (in either sense) to select another item. You can only step forward in a menu.
- 4 Turn the **Brightness** knob to adjust the selected item.
Turn clockwise to increase the value. Turn counter-clockwise to decrease the value.
- 5 After you have adjusted an item, turn the **Contrast** knob to select the next item or the next menu.



To exit the menu system:

- 1 Turn the **Contrast** knob until the Save Changes dialog appears in the OSD:
- 2 Turn the **Brightness** knob to toggle between Yes and No. Select Yes to save the changes, select No to exit without saving the changes.
- 3 Turn the **Contrast** knob to exit.

See also: Menu Exit, later in this chapter.

A word about the memory system

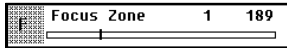
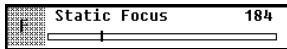
As explained in the introduction of this manual, the memory of the display can hold four different scanning formats. Each scanning format is characterized by the following parameters: Horizontal sync. frequency, horizontal sync. polarity, vertical sync. frequency, and vertical sync. polarity.

If the parameters of the connected signal are the same of the parameters of one of the scanning formats in memory, the automatic scanning system selects this scanning mode. This means the image on the display adapts to all the adjustment values stored in this scanning mode.

In case the connected sync signal doesn't match one of the stored scanning modes, the automatic scanning system selects the *nearest* scanning mode. This means the scanning mode of which the stored sync frequencies are as close as possible to the sync frequencies of the connected signal.

When you change one or more adjustment values, and you decide to save the changes upon exit of the menu system, the changed values are stored in the actually selected scanning mode. This means **the actually selected scanning mode is overwritten** by the new adjustment values.

Focus

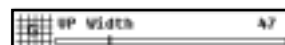
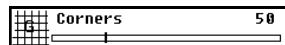
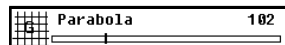
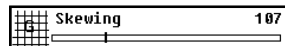
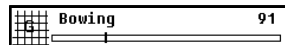
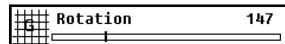
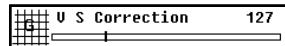
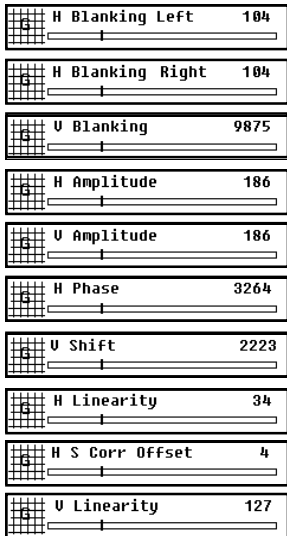


- 1 Turn the **Brightness** knob once to enter the Focus menu. The first focus adjustment appears: Static Focus.
- 2 Turn the **Brightness** knob to adjust static focus. Static focus has effect on the complete screen.
- 3 Turn the **Contrast** knob to switch to the next focus adjustment. This is the first of 9 zone-dependent focus adjustments.
- 4 Turn the **Brightness** knob to adjust the focus in the selected zone.
- 5 Turn the **Contrast** knob to select the next zone.

Geometry

- 1 Turn the **Brightness** knob once to enter the Geometry menu. The first geometry adjustment appears: H(orizontal) Blanking Left.
- 2 Turn the **Brightness** knob to adjust.
- 3 Turn the **Contrast** knob to switch to the next adjustment.

The geometry adjustments are:



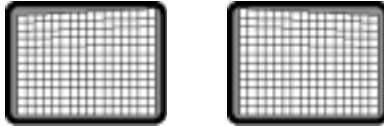
Important: VP Width is a service adjustment. It can be done by means of the proper tools only. The adjustment is described in the Service Manual.

If your display is equipped with the Southern Hemisphere option, the on-screen display menu contains additional functions to adjust the image geometry.

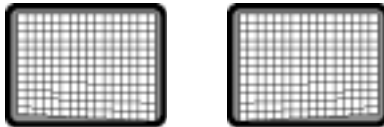
The **Southern Hemisphere** commands are in the Geometry menu:

- **SH Compensation On (Off)**: For proper geometry adjustment in the Southern Hemisphere, SH Compensation must be ON. If not, the SH controls will not function.

- **SH Comp. Top:**










- **SH Comp. Bottom:**



Info

Turn the **Contrast** knob to switch to the next menu.

 Display type: MGD2621P
 Serial no: 123123
 Display no: K5300110
 Software no: V560706101
 Software version: U 1.01
 Lifetime: 26 hours
 Scan mode: 1 1200x1600

This is the display type.

This is the display's serial number

This is the display's order number.

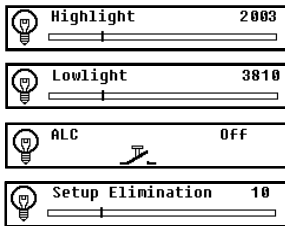
The order number of the internal software.

The internal software version.

The total operating time since production.

The currently selected scan mode.

Light

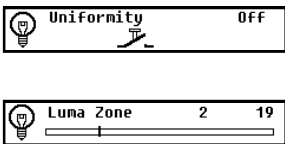


IMPORTANT: These adjustments are **service adjustments**. They have to be done by means of the proper measurement tools.

Do not adjust if you don't have the right skills and equipment!

These adjustments are described in the Service Manual.

Luma equalizing



Turn the **Brightness** knob to toggle the LUC system between Off and On.

IMPORTANT: The normal way to adjust Luminance Uniformity Correction (LUC), is the automatic way, using MediCal. The manual, zone-dependent adjustments are **service adjustments**. They have to be done by means of the proper measurement tools.

Do not adjust if you don't have the right skills and equipment!

These adjustments are described in the Service Manual.

Miscellaneous



Turn the **Brightness** knob to toggle the Backporch clamping between Off and On. The normal setting is: Off.

If Backporch clamping is switched off, clamping is on the sync tip.

IMPORTANT: Improper setting of the Backporch clamping can result in incorrect luminance output.

Turn the **Brightness** knob to toggle the Orbiter between Off and On.

The Orbiter slightly and slowly moves the image to prevent pixel burn-in.



Turn the **Brightness** knob to toggle the automatic Power Save system between Off and On.



Turn the **Brightness** knob to set the Remote time-out. This is the time, expressed in seconds, before the display interrupts the communication with the computer if the computer does not respond anymore.



Turn the **Brightness** knob to set the display's address. This is necessary if several displays are controlled by the same computer (by means of MediCal). In that case, every display must have a different address.

Mode selection



This is the indication of the current scanning mode. If the scanning mode system is set to Manual (see further), you can select another scanning mode by turning the **Brightness** knob.



Turn the **Brightness** knob to toggle the Automatic scanning system between Off and On. When switched to Off, the scanning mode selection is manual.

Menu exit



- 1 Turn the **Brightness** knob to enter the Exit menu. The Save Changes dialog appears.
- 2 Turn the **Brightness** knob to toggle between Yes and No. Select Yes to save the changes, select No to exit without saving the changes.
- 3 Turn the **Contrast** knob to exit.

Note:

A number of settings and adjustments are saved directly after changing them. They are: ALC on/off, Backporch clamp on/off, Remote timeout, Luminance uniformity, Orbiter, Power save, Address, Rotation, and all Southern Hemisphere adjustments.

MAINTENANCE

Picture tube

The glass panel of the picture tube is handled with a special coating. Take care not to damage or scratch the coating.

Clean the picture tube with a soft woollen or cotton cloth.

The cloth should be moist, not wet!

Use a watery solution or a mild commercial glass cleaning solution.

Apply (e.g., spray) the solution on the cloth, not on the picture tube.

Cabinet

Clean the cabinet using a recognised cleaning product for medical equipment. The cloth you use must be moist, not wet!

The cabinet has been tested for resistance to the following products: Cidex, Betadine, Alcohol (Isopropyl and Ethyl), Ammonia-based cleaners (Windex) and Aquasonic Gel.

TROUBLESHOOTING

There appears no image on the picture tube, the green LED on the front is out

- Check if the power cord is properly connected to the power outlet and to the display.
- Check if the power button is depressed.
- Check if contrast and brightness are not set to 0.

There appears no image on the picture tube, the green LED is on

The display is switched in Stand-by by the automatic Power saving system.

- Try to switch on the display by pressing any key on the keyboard of the computer that produces the video and sync. signals for the display.
- Check if both horizontal and vertical sync. signals are connected to the display and to the computer.

On the picture tube appears the message "No Valid Sync Signal"

- Check if both horizontal and vertical sync. signals are connected to the display and to the computer.
- Check if the sync. signals are connected to the proper inputs (refer to the chapter "Installation").
- Check if both horizontal and vertical sync. frequencies match the display specifications (refer to the chapter "Technical specifications").

For other problems, please consult your technical service department.

APPENDIX A: BACKGROUND INFORMATION

Clamping

Inside the display, the video signal from the video input is connected to the video amplifier. This circuit amplifies the signal, paying special attention to two signal levels: the amplitude and the dc-level. The dc-level of the video signal in the video amplifier determines the eventual **black level** of the image on the picture tube (CRT).

The circuits of the video amplifier can pick up interferences from different ambient sources. These interferences can change the dc-level of the video signal. In the end, the black level of the image on the CRT will be incorrect and unstable.

This is avoided by special clamping circuits inside the video amplifier. They clamp a particular part of the video signal to a constant dc-voltage. In this way, the video dc-level and thus the image black level is kept constant.

In a color display, clamping is normally done on the *backporch*. This is the part of the video signal that follows the sync pulse. But if the video signal's backporch is too small for clamping, another part of the signal has to be chosen. In that case, *sync tip clamping* has to be selected.

In the MGD 2621 P, clamping is best (and default) done on the sync tip.

Luminance Uniformity Correction

A characteristic (or limitation) of every picture tube (CRT) is that the luminance decreases towards the edge of the screen surface. The decrease is normally 20 to 30 %.

This is caused by the shape of the picture tube. Inside the CRT, a so-called *electron gun* shoots an electron beam towards the front (the glass panel). Because this panel is rather flat instead of having a spheric shape, the electron beam has to 'travel' a longer distance in the corners than in the center. So the intensity is higher in the center.

This phenomenon is even increased by the irregular distribution of the phosphor and aluminium layer on the glass panel. These tend to

be thicker in the center.

BARCO has developed a special system, called Luminance Uniformity Correction (LUC), that solves this problem. The LUC system enhances the light output at the edges of the CRT, so that the luminance there is the same as in the center.

The LUC system is calibrated in the factory. From time to time, it has to be re-calibrated at the customer's site by means of the light sensor you use for normal color calibration. The system can be calibrated and switched on or off by a qualified technician.

Power saving system

The display is equipped with circuits that can handle power saving management. When the system is switched on, it can power down the display in several steps.

The system is controlled by the imaging board or the PC that delivers the video signals. When you are working on the computer, the imaging board delivers both sync signals, and the display is operating normally. When you don't touch the computer keyboard for a certain time, the imaging board only delivers vertical sync. This is sensed by the display's micro controller, that blanks the image on the CRT. This results in a drop of power consumption with about 30 %.

When you leave the computer idle for a longer period, the imaging board now delivers horizontal sync only. As a result, the display's micro controller switches off a number of internal circuits. The power consumption has now dropped with about 35 %.

At last, the imaging board delivers no sync signals at all, and the micro-controller switches off all but one power supplies in the display. Only the micro-controller's own supply keeps on running, resulting in a very low power consumption of 5 W.

If you start using the computer again, the imaging board switches on both sync signals, and the micro-controller switches on the display.

The times after which the different steps of power management must become active, is set in the PC's display properties.

APPENDIX B:

TECHNICAL SPECIFICATIONS

Picture tube:

Faceplate transmission: +/- 33%
Faceplate type: ARC panel
Image representation: portrait
Phosphor: P45

Light output:

Calibrated: 300 cd/m²
Peak: 600 cd/m²

Resolution:

Max. address. pixels: 1280
Max. address. lines: 1600

Scanning systems

Horizontal scanning:

Multi sync: -controller controlled
Minimum frequency: 80 kHz
Maximum frequency: 130 kHz
Minimum blanking : 2.4 s
Storable scan frequencies: 4
Prealigned scans: 1 + VGA

Vertical scanning:

Minimum frequency: 48 Hz
Maximum frequency: 150 Hz
Minimum blanking: 300 s (after leading edge)

Geometry

Nominal size (4/3 ratio): 300mm x 400mm
Nominal size (4/5 ratio): 304mm x 380mm

Inputs

Video

BNC connectors
Nominal level: 0.7 Vpp

Sync

BNC connectors
Nominal level: 0.5 Vpp

Communication inputs/outputs

RS232 9-pin sub D connector
Baudrate: 9600

Power supply:

Voltage: 100 - 240 V +/- 10%
Frequency: 50/60 Hz
Current: 2.3 A

Environmental

Temperature range (°C):

Storage: -20/+65
Operation: 0/+45
Within specs: 15/+30

Altitude: storage: 25 000 ft
operational: 10 000 ft

Humidity (relative): 95 % max., non condensing

Weight:

Unpacked	Packed
approx. 39.8 kg	approx. 58.3 kg

Dimensions packing:

H x W x D: 788mm x 630mm x 780mm

Dimensions monitor (mm):

Height:	558
Width:	400
Depth:	561

Modifications reserved.

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